

Notice of Allowability

Application No.

09/870,257

Examiner

Tracy Dove

Applicant(s)

MATSUMOTO, ISAO

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/22/04.
2. ☒ The allowed claim(s) is/are 1-4,6-9 and 22.
3. ☒ The drawings filed on 30 May 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Decon Lower on 5/21/04. The after final amendment filed 4/22/04 has been entered.

The application has been amended as follows:

In the Specification:

On page 8, line 22; replace "Fig 1 is a schematic cross section view" with "Figs 1(a) and 1(b) are schematic cross section views".

In the Claims:

Cancel claims 10-21 and 23.

In claim 1, last line; delete "areas closer to".

In claim 4, line 2; after "wherein" delete ", in the vicinity of the edges of said concave and convex parts in said conductive electrode substrate,".

In claim 22, lines 2-3; after "arranged alternately" delete "or the groups of concave parts and the groups of convex parts are arranged alternately".

The following is an examiner's statement of reasons for allowance: The claims are directed toward a non-sintered thin electrode for a battery wherein the electrode includes an active material powder filled into or coated onto a conductive electrode metal foil substrate having a three dimensional structure. The conductive electrode substrate has innumerable

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hollow concave and convex parts. The metal foil conductive electrode substrate has a thickness close to that of the entire electrode (substrate and active material). The number of concave parts is equal to the number of convex parts. Each concave part is adjacent to a convex part and each convex part is adjacent to a concave part. The convex parts and concave parts include edges located in close proximity to a surface of the electrode. Walls of the concave and convex parts are contoured in one direction so as to be more tilted in the same direction at the edges of the concave and convex parts.

Note the specification defines a "thin electrode" as an electrode having a thickness of 500 μm or less (page 10, line 3; page 13, lines 15-17).

The prior art does not teach the non-sintered electrode of the claimed invention. Specifically, the prior art does not teach a non-sintered electrode having a three dimensional conductive metal foil substrate having concave and convex parts wherein the convex parts and concave parts include edges located in close proximity to a surface of the electrode. Walls of the concave and convex parts are contoured in one direction so as to be more tilted in the same direction at the edges of the concave and convex parts. Kawano et al. WO 99/63608 teaches a non-sintered electrode having concave parts and convex parts. However, Kawano does not teach the edges of the concave parts and convex parts are bent in the same direction at edges of the concave parts and convex parts. Figures 2A and 2B of Kawano show a three dimensional metal substrate, but the edges of the concave and convex parts are straight as compared to Figure 1(b) of the instant application wherein the three dimensional metal substrate comprises concave and convex parts wherein the edges of the concave and convex parts are bent (tilted).

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The bent or tilted edges of the concave and convex parts of the substrate improve the adhesion of the active material powder to the substrate (prevent the shedding of the active material powder; bottom of page 7-top of page 8 of specification). Kawano does not teach or suggest bending or tilting the edges of the concave and/or convex parts of the substrate to improve the adhesion of the active material powder to the substrate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Tracy Dove", written in a cursive style.

Tracy Dove
Patent Examiner
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May 21, 2004